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Third Stone From the Sun

Sun Microsystems challenges Apple and IBM

A viable alternative to OS/2 and the Macintosh operating system for desktop publishing applications has arrived: it is Unix.

Although Sun Microsystems' new 386i Unix workstation is described as just that — a workstation, not a personal computer — it is priced competitively against other 80386-based platforms and the Macintosh II, offering MS-DOS 3.3 compatibility as well as more functionality than other personal computer platforms. The biggest hurdle to acceptance of the 386i is that Sun has not developed a plan to distribute the 386i as a competitor in the personal/desktop computer market.

Although we recently wrote about Unix as a publishing platform (*March '88 issue, vol. 3 #3, "Glimpses of Nirvana"*), Unix deserves a second look because it is now a realistic and affordable alternative when compared to Apple's Macintosh operating system and Microsoft's OS/2. It is the first major operating system to both

take full advantage of the Intel 80386 processor's protected mode, and to offer true multitasking in a desktop computer.

The one previous drawback of Unix — the lack of a visual interface to make it easier to use — has now been addressed by Open Look, a window system specification that rivals the visual interfaces from Apple and Microsoft/IBM. Unix had the first multitasking and multiuser applications. Now, with Sun Microsystems, AT&T, Xerox, and over fifty other Unix system vendors endorsing Open Look, there should be enough momentum to increase acceptance of Unix for corporate systems. By contrast, there is hesitating acceptance of OS/2 because it is too new a product to have withstood the test of time, and it does not yet take full advantage of the 80386 processor, although a promised successor (OS/386) will.

Open Look has many attractive aspects, starting with the fact that it runs on top of either MIT's standard

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X Windows (version 11) or Sun's NeWS/X.11. The toolkits for Open Look applications should be available this fall, and Unix, as the most widely used development system, provides a stable environment for debugging C code. Sun is bringing the Open Look environment to the three most popular processor families: 80386, 68020/68030, and Sun's own SPARC. As a result, large software companies, such as Lotus and Ashton-Tate, have already committed resources to develop applications for Open Look.

In short, if you were waiting for a technical alternative to DOS, OS/2, and Macintosh, look at Sun's 386i. The strongest competitor in operating systems at the high end of personal computing is the Unix/Open Look system, and the most attractive hardware for this combination is the 386i. However, Sun's long-term

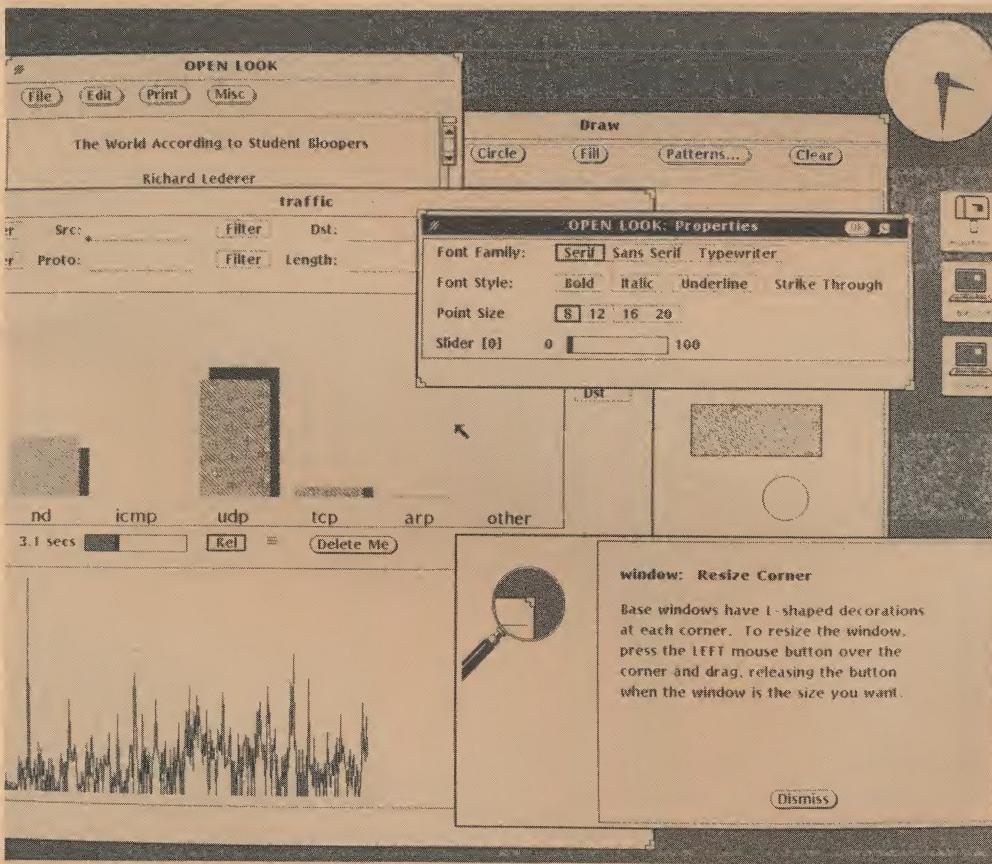
vision must also be applied to marketing and distribution, not just technical excellence. Sun manufactures the best Unix/Open Look hardware for desktop computing, but it has not yet marketed and distributed this platform to the rank and file corporate PC user.

Sun's 386i: Foxy Workstation

Sun's 386i is a desktop publisher's dream machine because it effortlessly links DOS and Unix programs with other workstations on Ethernet. Desktop publishers using the 386i have more software to choose from than anyone else, because they can use both popular DOS programs such as Ventura Publisher and PageMaker and popular Unix programs such as Interleaf and FrameMaker. The 386i

includes system software enabling you to cut or copy from, say, a DOS window and paste into a Unix window, and it runs the same SunOS that runs in higher-performance Sun workstations.

The 386i outshines all other 80386 platforms that have been announced so far. The two announced configurations include either a 20 MHz or 25 MHz 80386, an 80387 floating point coprocessor, from four to sixteen megabytes of RAM, three AT-style expansion slots, one XT slot, and four high-performance 32-bit slots. Each workstation is also configured with a SCSI controller (for SCSI storage devices), an ASIC Ethernet adaptor, RS-232 serial and parallel ports, a 3.5-inch (1.44 megabyte) floppy disk drive, and a three-button mouse. The systems are priced from \$7990 to \$19,990 (full configuration includes a



AT&T and Sun have developed the Open Look visual interface to Unix and are promoting it as an OSI standard for the 80386, 68020/68030, and SPARC processor families. Open Look has features not found in other visual interfaces, including a push-pin icon for keeping menu items displayed, and scrolling elevators that require less mouse movement.

19-inch color monitor and a 327-megabyte hard disk). Options include a peripheral expansion unit to handle two additional 327-megabyte hard disks and a 60-megabyte tape backup system.

Sun rates the low-end 386i configuration (20 Mhz 80386, four megabytes of RAM) at more than 3 MIPS (million instructions per second) and the high-end 386i configuration (25 Mhz 80386, eight megabytes of RAM) at more than 5 MIPS. All configurations can be upgraded to have at least 16 megabytes of RAM.

The 386i runs SunOS, a version of Unix that is source-compatible with the SunOS for Sun's line of SPARC (scalable processor architecture) and 68020/68030 workstations. The current version of SunOS is a convergence of AT&T System V.3 and 4.3/4.2 BSD (Berkeley Standard Distribution), and is therefore one of the most important progenitors of the merged Unix that is planned by AT&T and Sun.

For its DOS Windows environment that runs on SunOS, Sun has licensed Phoenix Technologies' VP/ix and ROM BIOS. With DOS Windows, you can copy or cut and paste information between MS-DOS windows or between MS-DOS and Unix windows, and run several MS-DOS applications at once. The system utilizes up to two megabytes of RAM for each DOS application, bypassing the 640K limitation of DOS, and includes support for Hercules and CGA graphics (optional cards are available to add EGA and VGA support). DOS window systems such as Microsoft Windows and DesqView also run on the 386i under control of Sun's DOS Windows.

When compared to other 80386-based desktop and floor-standing computers that can run Unix and DOS, Sun's 386i comes out the winner in both performance and price. Compaq's Deskpro 386/20 is one of

the fastest machines available, but configured with Microsoft's Xenix (a version of Unix), it is priced at about \$14,000. It is more expensive and less functional than Sun's 386i/150 (fully configured at \$11,000). A similarly-configured PS/2 Model 80-111, outfitted with AIX PS/2 (IBM's version of Unix), is priced at approximately \$17,000.

A Purple Haze Around Sun

A royal aura surrounds Sun Microsystems, a company that resisted several buyout overtures from Apple because the engineers disliked Apple's attitude. Sun's Bill Joy is an acknowledged guru of Unix development and a high profile visionary at important personal computer conferences. Sun's Scott McNealy speaks at these conferences with the zeal of a presidential primary candidate. Many developers we know speak reverently of Sun's workstations as the best on the market, and one continually refers to his Sun 4 workstation as his idea of a "personal" computer.

Sun has either created or supported the industry standards in the workstation market, including the NFS (Network File System) used in workstation networks, PostScript used for output and display (NeWS), and Unix in the form of SunOS and now in the merged Unix. Sun has also taken the initiative in making lower-cost workstations for popular business applications such as electronic publishing. Sun is on a progressive track by trumpeting the sex appeal of its computers, compared to the focus on performance (over ease of use) of other workstation vendors.

Sun's former arch rival, Apollo Computer, is now merely another workstation company focusing on high performance, claiming that its workstations are designed for those

who have a "passion for performance" (according to its recent *Wall Street Journal* ad campaign). Certainly Apollo lost some of its prominence in relation to Sun as a result of Sun's technological achievements in the operating environment and network file system. Sun then captured the limelight with hardware and software that defines a "personal workstation" or "high-end desktop computer" (whatever you want to call it). Apollo continues to lose momentum to Sun because it has not joined the race to produce consumer-oriented Unix machines.

The answer to Apollo's dilemma may be the visual interface with icons from the British firm IXI Ltd., which may also be licensed by IBM for use with its AIX and by NeXT for use with its Display PostScript environment. However, Apollo still tends to favor the high-performance command-driven interface for power Unix users, and may not compete at all in the lower end of the market.

NeXT has the advantage over other Unix workstation vendors in that the media already has a love/hate affair with its chairman, Steve Jobs, and the industry is quite curious about the NeXT machine that will sport Display PostScript and a version of Unix called Mach (developed at Carnegie-Mellon). Steve Jobs knows how to make machines look and feel sexy and has an uncanny knack for designing machines that are easy to use. Steve may have outgrown some of the ideas of closed architectures and proprietary systems that still plague his former company, Apple. But, the media hungers for a dashing new role model. Sun's combination of Scott McNealy and Bill Joy is tantalizing because McNealy is an effective open systems evangelist and Joy is an acknowledged Unix guru.

The focus on Unix for high-powered desktop computing may leave Apple in the dust. We postulate

that Apple could save the embarrassment of losing out in the Unix world by adopting Sun's NeWS toolkit for A/UX (its version of Unix). A/UX in its present form is almost useless — there is no way to transfer files to and from A/UX and the HFS (Hierarchical File System), and you can run only one Macintosh application at a time (there is no equivalent to MultiFinder). Compared to the Sun 386i, the Macintosh II is a poor, kludgy Unix host — all the excitement surrounding the Macintosh II is due to MultiFinder and advanced color features that are not supported by A/UX.

Unix can offer the best of both worlds: universality in the operating environment and proprietary extensions for improved performance and functionality. Unix vendors have plenty of experience creating turnkey systems for naive users, since that is the primary business of a Unix VAR. By generalizing the techniques used to make Unix a turnkey system, Sun is in a position to create a new standard for desktop computing.

If Unix Was One

However, the lack of a binary standard for Unix — a program interface standard at the binary level for all versions of Unix, so that a program's object code runs in all versions — makes it difficult for software vendors to develop new applications or convert existing DOS applications. Programs can be source-code compatible, but they must be recompiled for each version of Unix, making it impossible to offer one version of a program that runs on all Unix systems. These limitations have forced Unix to remain within the realm of value-added resellers (VARs) who package

workstations with appropriate software. Retail sales of Unix applications will not become a reality until a binary standard takes hold.

AT&T (the original developer of Unix) has contracted Sun to develop an Application Binary Interface (ABI) so that Unix programs can be developed to run on all standard Unix workstations and systems. In addition, Sun and AT&T intend to optimize the ABI for the instruction set used by Sun's RISC-type SPARC processor, thereby ensuring that Unix will remain the standard operating system for higher-performance RISC processors of the future (and for the long-rumored "SPARCintosh" from Sun that is supposed to be a NeXT-killer as well as Mac-killer). Not surprisingly, a group of Unix workstation manufacturers have applied pressure on AT&T to endorse other interfaces.

AT&T's goal is to create a version of Unix that is acceptable to the largest Unix hardware vendors and available through open licensing. Sun's goal is basically the same, but also stresses the advancement of open systems in general (and of the SPARC processor in particular), paving the way for SPARC-based personal computers.

To advance both goals, Sun and AT&T announced the Open Look visual interface specification, and Sun rolled out the first inexpensive, integrated DOS/Unix environment for the 80386 processor. It was no

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Compared to DOS, OS/2, and the Macintosh operating system, Unix is a haven of democracy (if there is such a concept in computing) and offers freedom from litigation.

accident last year that Sun bought TOPS (formerly Centram Systems), because Sun is using TOPS software to become the prime integrator of Unix, PC, and Macintosh applications. The formidable combination of low cost and integration with existing business applications is irresistible and will most likely prevail, overcoming the efforts of workstation manufacturers to advance proprietary binary interfaces.

Open Look: In From the Storm

Unix has the power and flexibility to support process-to-process communications, multitasking, virtual memory, multiple networks, and multiple window systems. The raw power of Unix stems from its command-line interface, but no visual interface of icons and menus has so far been widely adopted, with the exception of Sun's SunView and Organizer file system, which are part of SunOS. Interleaf has also pioneered a visual interface that has been used in conjunction with SunOS and other workstation interfaces and toolkits.

After talking to Unix developers, we understood why they have no need for a visual interface. Unix systems have such large capacity hard disks that it would take too long to click through iconic folders to find files. Unix offers pipes to automatically transfer the output from one program to another, using filters for automatic conversions. Unix has stream editors for making changes to several files in a batch-oriented, all-at-once method, instead of requiring user interaction. Neither pipes and filters nor stream editors are offered in current visual interfaces, such as the Macintosh MultiFinder or Microsoft Windows.

Although all of Unix is available

from its command-line interface, few business application users will want to spend time learning Unix commands, except perhaps to use the optional mail system that can be implemented in a Unix network. However, even this mail system begs for a visual interface, which would be far more useful in electronic publishing than the command-line interface (this is why Interleaf and Frame Technology invented their own visual interfaces).

It is in the climate of a legal hailstorm (involving Apple, Microsoft, and Hewlett-Packard) that AT&T and Sun have introduced Open Look, which fills the vacuum of a standard visual interface to Unix. Open Look doesn't look exactly like a Macintosh but has similar look and feel components that can't be challenged by Apple because they were licensed directly from Xerox.

Open Look on a Sun workstation is an attractive alternative to the Macintosh II and to IBM's Presentation Manager, especially because Sun and AT&T are advancing its look and feel as an OSI standard for different processor families. In addition, Open Look has some features not found in any other visual interface, such as the push-pin icon for keeping menu items displayed, and scrolling elevators that require less mouse movement.

The value of Open Look to network publishing is the interoperability of Unix applications (provided by a standard ABI) and the lessened need for retraining for new applications. Another advantage specific to Sun's implementation is the ability to display PostScript (since Sun's Open Look is based on NeWS/X.11). In network publishing applications, pages need to be viewed at any workstation on the network, and a publication must be worked on by many users at the same time. NeWS can be used as a platform for running

network applications that display such pages on any workstation on the network.

We predicted a few months ago that Sun would endorse the Presentation Manager for Unix, under pressure from Microsoft and AT&T. But it comes as no surprise that Sun rejected this notion and convinced AT&T that Sun could either design its own visual interface or license elements of one from Xerox. Sun is a leader in technology, not a follower, and Sun's most important goal is to forge new standards, not succumb to existing ones. Until Open Look is finished this fall, we must withhold judgement on whether it is better or worse than Presentation Manager.

We still expect to see an implementation of IBM's and Microsoft's Presentation Manager for X-Windows, probably developed by Microsoft using the graphical engine of NeWS (Microsoft has already paid Sun for an unlimited license for NeWS code). Digital Equipment Corp. may also develop a version of the Presentation Manager for DECwindows utilizing Display PostScript. Thus PostScript may eventually be used as the imaging model for displays in both the OS/2 and Unix worlds, even if the visual interfaces differ radically.

Electric Unixland: WordPerfect to Atex

Market research firms estimate that between 15 and 25 percent of all 80386 machines are sold with Unix. Unix system sales grew by more than 70 percent from 1986 to 1987, according to AT&T, and over 700,000 Unix systems have been sold since 1981. However, these numbers are minuscule in relation to the installed base of over eight million DOS machines. They loom much larger

over the nonexistent installed base of OS/2. Now, Unix machines using the 80386 processor can run DOS applications better than OS/2 can (due to the use of the 80386 processor's protected mode, and less compatibility problems). If Intel doubles or triples its shipments of the 80386 processor over the next two years, Unix will gain a strong foothold in the PC market, perhaps gaining an edge over OS/2 (which is based on the 286 processor).

Users may think of Unix as an alternative to OS/2, but large software development companies such as Lotus and Ashton-Tate look at Unix as a base for expansion, not as a replacement for OS/2. WordPerfect already offers a Unix version of its popular word processor, and Borland subsidiary Ansa has announced a version of Paradox for the Unix market. Microsoft Word and MultiPlan are available for the SCO (Santa Cruz Operation) version of Xenix.

As personal computer software vendors eye the Unix base, traditional Unix application vendors are also reaching a new customer base, and the vendors of proprietary electronic publishing systems are moving to Unix platforms to take advantage of this situation. Sun is poised to capitalize on the marketing thrusts of publishing system vendors, ranging from Atex, Bedford, and Compugraphic to Scribe Systems, Texet, Unda, and Wang. Thus the computing price-performance gains have brought the power of large, proprietary electronic publishing systems down to Sun's desktop.

Many have waxed polemic on the virtues of OS/2 as the eventual platform for large-scale electronic publishing applications that are integrated with a customer's total information system environment. Companies such as Interleaf are

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News Analysis

Tandy Introduces Erasable CDs

Tandy Corp. recently unveiled technology to produce erasable compact discs (CDs), opening up the possibility of using CDs as a storage medium as well as a publishing medium. Labeled THOR-CD (Tandy High-intensity Optical Recorder Compact Disc), the technology could replace or complement other storage systems such as WORM (write once, read many times) discs. THOR-CD devices are not expected to appear on the market for at least 18 months, and the first devices will likely be for audio, with data storage devices to appear a year later.

Tandy believes that THOR-CD devices could be priced under \$500, and that THOR-CD drives could read regular CDs as well as erasable CDs. THOR-CDs look just like regular CDs or CD-ROMs, but can record as well as play back music, video, and data. The THOR-CD format will meet the specifications for the High Sierra (ISO 9660) format now used in CD-ROM drives. THOR-CD Discs are coated with a polymer that forms bubbles when struck by a laser beam, and bubbles can be removed by a laser beam. Discs can be erased over fifty times with no degradation, according to Tandy.

According to Phillips, both Phillips and Du Pont Optical Co. have the technology to produce erasable CDs but have chosen not to do it, due to a perceived lack of market demand. Experts believe the discs may not be useful if you can only erase them fifty times. However, if THOR-CD discs are as inexpensive as CD audio discs, a fifty-recordings life cycle would not deter us from using them.

Ricoh Licenses Adobe PostScript

Adobe Systems signed a deal with laser engine manufacturer Ricoh, allowing Ricoh to use Adobe's PostScript interpreter in laser printers marketed in both Japan and Western markets (including the U.S.). Ricoh will bundle Adobe's PostScript interpreter with its printer engines for sale to OEMs. This move counters the deal signed last fall between Phoenix Technologies, a PostScript clone developer, and Canon, the leading manufacturer of laser engines.

Adobe now has Fujitsu, NEC, Matsushita, and Ricoh lined up behind its interpreter, and appears to have locked up the Japanese market. In a related move, Adobe Systems, in partnership with Morisawa, Ltd., a Japanese typeface developer, completed development of its PostScript language Kanji character set (7000 characters) called *Ryumin* Light.

WordPerfect, FullWrite Finally Ship

The two most talked-about word processing programs for the Macintosh, from WordPerfect Corp. (WordPerfect, \$395) and from Ashton-Tate (FullWrite Professional, \$395), are finally shipping. WordPerfect shipped first, followed one week later by FullWrite (if you're keeping score). WordPerfect had a false start when it had to recall 8800 copies from dealers and users to fix a last-minute bug, but shipments have since proceeded normally.

WordPerfect provides column-style formatting and lets you change fonts for text and add graphics in the text body or in headers or footers. The program automatically hyphenates and offers manual kerning with automatic leading control.

FullWrite Professional offers all of these features plus the ability to create and edit outlines of structured documents, so that you can move headings in an outline to move the text (similar to Lotus Manuscript for the PC). The program can also automatically produce a table of contents and an index, and organize a book's footnotes and bibliographic references. FullWrite includes Microlytics' Word Finder and a spelling checker.

Microsoft Word, the frontrunner, due to the previous lack of competition in Macintosh word processing features, will be upgraded to stay competitive with FullWrite and WordPerfect. Word version 4.0 will let you place graphics precisely on a page and edit a document while in preview display. The new version, not yet announced, will also let you customize pull-down menus to add new options or delete options. Microsoft must move quickly to upgrade Word or face stiff competition from FullWrite, WordPerfect, and T/Maker's WriteNow version 2.0.

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moving in that direction but have already established most of this functionality in the Unix world. DocuPro's Professional Publishing Software, designed for both commercial publishing and corporate desktop publishing/document processing, may surpass Interleaf in the Unix world and is already running on Sun's 386i. With Frame Technology, Scribe Systems, ArborText, Miles 33, OmniPage, and CText producing page makeup and document processing software, there is no shortage of competition in this market.

Sun's platform is already used in desktop prepress — Lightspeed, CAMEX and Unda offer systems, and the Barneyscan is available for scanning color slides. Qubix offers professional illustration software, and PostScript drawing programs are in the works (you can run DOS graphics programs, such as Micrografx Designer, in a DOS window on the 386i). Heavy players in high-end publishing, such as Atex, Bedford, Compugraphic, Eastman Kodak, Texet, and Wang, will employ the Sun 386i to gain a piece of the corporate electronic publishing market.

Sun's 386i, and future low-cost Unix platforms that will also run DOS applications and serve as integrators in a network of Macintosh computers and PCs, are irresistible to desktop publishers who want to use publishing tools in a network. The Unix world brings with it a plethora of standards used by traditional electronic publishers — from the government's SGML (Standard Generalized Markup Language) to the mathematician's TeX — that can play important parts in a corporate-wide electronic publishing system, in addition to desktop publishing standards, such as Encapsulated PostScript.

We can imagine a network where artists design pages using a program like PageMaker or Ventura Publisher, while writers and editors use a variety

of word processors to prepare text, and artists use different graphics programs to prepare the images. DocuPro or Interleaf can integrate these pages (through a conversion process) with lengthy documents that can be telecommunicated to remote printers or piped in SGML format directly to a government shredder, bypassing the reader who was too busy anyway looking up commands in the Unix Programmer's Manual.

There is one more outlook on Unix we share with some Unix developers who "just say no to MS-DOS." The history of Unix is littered with enhancements to the original design from many different outside sources, such as university labs. Although Unix has been thoroughly debugged by the best and brightest minds of America's institutions, it still represents a form of anarchy in the marketplace because no single company owns it. Compared to Microsoft's and IBM's DOS and OS/2, and to Apple's Macintosh operating system, Unix is a haven of democracy (if there is such a concept in computing) and offers freedom from litigation. Thus, programmers who dislike politics, litigation, and lowest-common-denominator standards that can't be enhanced, are orbiting Unix, where there is plenty of elbow room and solid networking capabilities.

Castles Made of Sand

In the Spring, Apple Computer usually hosts a series of dramatic product introductions. But this Spring was dramatic in other ways, none of them increasing Apple's popularity with the developer community that has recently

jumped onto the Macintosh bandwagon.

For one, Apple is discouraging cross-over products that run in both Macintosh and PC environments, even though two fine examples of such products are the biggest-selling programs for desktop publishing: Aldus PageMaker and Microsoft Word.

For another, Apple is discouraging the use of PostScript conversion "on the fly" by application programs for achieving better performance and functionality. Apple prefers that programs use the QuickDraw model, and leave the printer driving (and PostScript conversion) to Apple's driver. Yet such a move today would be impossible for most desktop publishing application programs, especially PostScript-drawing programs.

Apple's lawsuit, involving Microsoft and Hewlett-Packard over the look and feel of Windows and New Wave, is not the only action that has caused many in the industry to stop trusting in Apple's stated intentions. For example, although Apple has been promoting the interoperability of applications based on the OSI (Open Systems Integration) model, the company privately has an attitude problem with programs that run in both Macintosh and Microsoft Windows environments. Apple appears to be preoccupied with forcing other computers to look different, rather than advancing its interface as a standard. It seems to be a double standard that Apple promotes interoperability as a concept but is hostile to developers who try to implement interoperability from Mac to Windows.

Apple recently crossed Adobe's Display PostScript off its list of possible developments for the Macintosh. Adobe's position with Display PostScript is that hardware can get better without obsoleting software, which can stay progressive without

having to compromise quality for today's hardware-based standard. Display PostScript lets developers build applications that can work with a variety of displays, including future displays, without the need for a lot of device drivers.

But why should Apple, a company that prides itself on innovation and the unique nature of its machines, adopt a quasi-standard display technology that has already been adopted by its competitors (such as NeXT with Display PostScript, and Sun with NeWS)? Why should Apple restrict its display technology development to conform to a common denominator (Display PostScript) controlled by Adobe Systems?

Apple's view is that its proprietary technology gives it a leading edge in competition against the new IBM world and the existing PC-compatible world. What would have happened if Apple had bought Adobe Systems and PostScript in 1985? Today, Display PostScript is not consistent with the current Apple philosophy of having control over system software. QuickDraw, on the other hand, can be freely extended and controlled by Apple.

Apple now has no tolerance for programs that create their own PostScript code for output. Apple doesn't want developers to bypass LaserPrep, bypass the LaserWriter driver itself, bypass both, or perform tricks for specific devices. Apple wants developers to use QuickDraw and let Apple control the rest. For example, Aldus Prep (the PageMaker printer driver that uses Apple's LaserWriter drivers but prepares its own PostScript code) would cease to exist if Aldus followed Apple's strict guidelines.

Manhattan Graphics, developers of ReadySetGo! 4 for Letraset, may have foreseen Apple's position, since it is one of very few desktop publishing products to rely on Apple's printer driver exclusively. It is not a coinci-

The challenge for Apple is to develop a version of QuickDraw offering a level of compatibility with Display PostScript while maintaining QuickDraw's bit map graphics capabilities.



dence that ReadySetGo! 4 was criticized for not having as precise a measure of kerning control as the other products — the developers justifiably pointed to Apple's software as the problem. The program had a few problems with resized bit-map images, also attributed to Apple's printer driver. Aldus and Quark got around these problems by performing tricks or bypassing the driver — techniques that Apple would like to ban.

Macintosh developers agree that a standard driver would make program development easier, but the current version of QuickDraw is not capable of handling either publishing or CAD/CAM applications due to the limitation in amount of coordinate space and the lack of facilities for text rotation, halftones, and resolution independence. Besides, there are no high-resolution QuickDraw typesetters ready to replace PostScript typesetters.

PostScript lets customers choose between printers and typesetters that offer a variety of resolutions and performance benefits. The goal of Adobe's Display PostScript is to make this choice work for displays as well. A common interface to displays would help in the development of network applications capable of running an application on one workstation and displaying the result on another workstation, as in Sun Microsystem's NeWS. But the most important benefit for displays in publishing and graphic arts is the ability to match printed output.

If Apple intends to continue leading the graphic arts and publishing markets, Apple must reckon with displaying PostScript instructions in its new version of QuickDraw. If a version of QuickDraw is introduced that is better than PostScript, then it makes sense for developers to leave the driving to Apple.

Meanwhile, developers must continue to use both graphics models to stay competitive. Developers don't want to intentionally cripple their programs while waiting for Apple to upgrade QuickDraw, and developers of PostScript drawing programs have no choice — they must break Apple's proposed rules simply to function properly. The challenge for Apple is to develop a version of QuickDraw offering the same level of compatibility with Display PostScript while maintaining QuickDraw's bit map graphics capabilities. Apple must meet this challenge before the next wave of open systems erodes Apple's lead in desktop publishing.



Max Headline: C-C-C-Cap the Typeface!

Capitalizing on its role as a leader in graphic design tools, Letraset is announcing this month an excellent complement to its ReadySetGo! 4 and ImageStudio products: a type, logo, and headline designing program called LetraStudio, and the Electronic Type Library of over 100 typefaces from Letraset's catalog of decorative faces. Letraset, with over three decades of

experience in serving the needs of graphic artists, has finally offered an electronic alternative to its Instant Lettering rub-down letters.

A designer can use the program (we call it Ready, Set, Logo!) to place characters on a page with considerably more freedom to resize and rotate characters and change their shape and spacing than with any other program. The result can be saved in an Encapsulated PostScript file for use with Adobe Illustrator, Aldus FreeHand, or other PostScript drawing programs, as well as with page makeup programs.

LetraStudio offers special effects

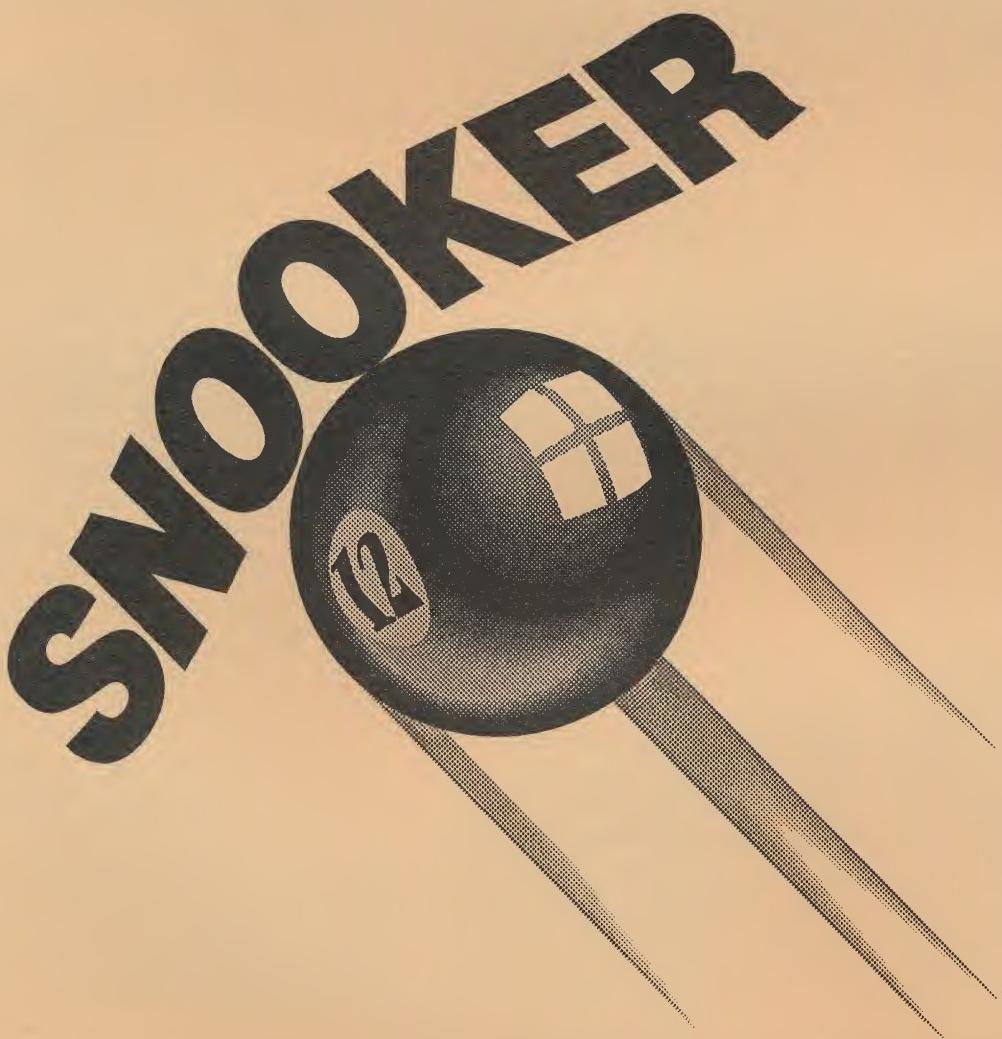
such as coloring, outlining, precise kerning, drop-shadows, optical distortions (chosen from a sample palette), curved baselines, and three-dimensional effects. The program displays accurate font outlines with immediate feedback. Type forms are treated as graphic objects that can be scaled, stretched, italicized, duplicated, or manipulated by moving handles for changing their shapes. The program lets you color objects with specific Pantone colors or percentages of process colors, and produces color separations as well as Encapsulated PostScript files. You can use LetraStu-

dio graphics with ImageStudio, combine them with scanned images, or use image processing techniques (softening, diffusion, airbrush effects, etc.). Multiple LetraStudio documents can be open simultaneously.

A grid and rulers showing inches, picas/points, or centimeters can be visible or hidden, and grids have several vertical and horizontal snap-to positions, in between the visible grid lines. You can set grid lines at an angle that also applies to guidelines.

You can also use a scanned image, paint file, or PICT file as a background template for tracing. The

*Letraset's
LetraStudio can
perform distor-
tions and other
effects on
display faces,
and save them
in Encapsulated
PostScript files.
(Artwork cour-
tesy of Letraset
U.S.A.)*



rotation tool works on baselines and graphic objects and is similar to Adobe Illustrator's rotate tool. LetraStudio includes a tool similar to Adobe Illustrator's zoom tool for magnifying or reducing the view. The LetraStudio line, arc, curve, rectangle/square, and circle/ellipse drawing tools are similar to MacDraw tools.

Use the text tool to type text, using standard Macintosh text editing features (including copy, cut, and paste). Each line is worked on individually, with no line breaks or wrap-around lines. As you enter new text, it adopts any typographic defaults or other settings in effect. You can specify, among other things, the baseline (straight or circular), alignment, font, type height, width as a percentage, and kerning or letter spacing. Units for width and kerning/spacing controls are not absolute — they get smaller as you zoom in to examine the display. The program also provides alternate character forms, such as ligatures, in the currently chosen font. Special effects are applied to existing text, not to new text, thus it is important to type all the text first, before working with special effects. In fact, once you apply baseline effects to a line of text, you can't edit the text in that line; you must create a new line.

When creating text with a circular or elliptical baseline, you can specify a radius for the circle, the text alignment, and whether text should be inside or outside the circle. Center anchor points can snap to the grid when moving or drawing, so that concentric circles or arcs can be quickly formed.

You can work directly with the baseline and with each character, adjusting position, size, shape, etc. You can rotate and slant individual characters, create a new baseline for specific characters, reverse characters

to mirror images, flip characters upside down, and move the baseline in any direction to stretch or squeeze letter spacing. Baselines can be angled, changed into a bezier curve, or changed into a circle or ellipse. You can create a mirror image of an existing baseline, proportionally enlarge and shrink a circular or elliptical baseline with text, and deform circular baselines into elliptical baselines.

A distortion tool provides straight-line and curvilinear distortion of characters, including shears, stretches, proportional scaling, flip-overs, and perspective effects. You can also distort text to look inflated, deflated, curved to one side, and suspended in an arch.

Special effects can be added to a dialog box, and Letraset plans to market a variety of additional special effects in the near future. You can save a particular variation of an effect that has, for example, the desired values for outline thickness and percent of gray tint, with a new name to be stored in the effects dialog box. The program offers a preview effect function to use before applying an effect.

The program is rich in the features that are not found in Adobe Illustrator or Aldus FreeHand, which makes it the perfect complement to these

programs. Nothing on the market comes close to providing the level of manipulation of characters. The combination of LetraStudio, ImageStudio, ReadySetGo! 4, and the Electronic Type Library is a mighty weapon in Apple's arsenal for proving that the Macintosh is still the best platform for professional-quality desktop publishing and graphic arts.

News Analysis

(continued from page 6)

Imagen, Conographic Ship PostScript Clone Printers

Imagen, the company that failed to make its DDL (Document Description Language) a standard, became the first company to ship a PostScript clone printer: the Imageserver XP. The interpreter, called UltraScript, interprets and prints standard PostScript pages. Imagen recently merged with QMS, which may improve Imagen's marketing capabilities while adding new products to QMS' product line. Imagen has an advantage in the clone race due to its prior licensing of Linotype fonts, which ensures that Imagen printers will be font-compatible with Linotype's PostScript typesetters.

Conographic is also scheduled to begin shipping this month a PostScript clone printer using the ConoDesk 6000 controller. The controller is a single-slot board for a PC XT or AT that uses a proprietary processor and 2.5 megabytes of dynamic RAM. It provides two modes of PostScript compatibility: PersonalScript, which is optimized for single-user printing, and ConoScript, for printing Encapsulated PostScript and PostScript files.

A designer can use Letraset's LetraStudio to place characters on a page with considerably more freedom to resize and rotate characters and change their shape and spacing than with any other program.

Desktop Presentations Maturing on the Mac

Several color slide presentation programs have been developed for the Macintosh including Cricket Presents... from Cricket Software, PowerPoint 2.0 from Microsoft, ReadySetShow from Manhattan Graphics, and MORE 2.0 from Living Videotext/Symantec. Cricket Software started shipping its \$495 program this month. PowerPoint version 2.0 (\$395), scheduled to ship this month, offers 24-bit color, text editing features, dictionaries, find-and-replace, and predetermined color schemes for quick production of slides. MORE 2.0 is not yet released, and ReadySetShow has not been formally announced.

Mac Version of AutoCAD Introduced

Autodesk will be demonstrating this month a fully featured version of AutoCAD for the Macintosh, which will be available this summer for about \$3000. AutoCAD, the most popular drafting program for computer-aided design and manufacturing applications, currently runs on Sun, Apollo, and DEC VAX workstations as well as PCs. AutoCAD on a Macintosh II is expected to perform better than on PCs due to the memory limitations in PCs. Users will be able to transfer AutoCAD drawings to and from PCs, Macintosh computers, and to other platforms.

Microsoft Improving Speed of Windows 2

A new release of Windows 2, now in testing, may appear as early as June. It should be much faster for running large applications such as PageMaker, because it provides up to 60K of extra

memory and better support of the Lotus/Intel/Microsoft Expanded Memory Specification (LIM EMS) version 4.0. The larger memory space reduces the need for code swapping, which slows down programs such as PageMaker.

Included with the release is a better PostScript output driver from Microsoft. For the last two years most desktop publishers replaced their Microsoft PostScript driver with a better one from Micrografx, and this situation is unlikely to change, since Micrografx has also released a new PostScript driver (\$199) that supports Adobe's color extensions and provides faster imaging (performance is increased by 25% to 100%), smaller file size, support for rotated text and large polygons (surpassing the limit of 1500 points in a path, allowing up to 5000), and the opportunity to scale the page independent of the application that produced it. Micrografx's driver also maps colors to black and white patterns and shades of gray. Since it uses the PostScript color model, it directly supports the QMS ColorScript 100 color page printer. This is the first Windows-based product to print directly to this color PostScript printer.

Apple Outlines Mac OS Improvements

During a developer conference in San Jose last month, Apple Computer revealed to developers the official game plan for operating system improvements over the next two years. Highlighted in the list of improvements were interapplication communication (IAC) and eventually inter-process communication (IPC), support for 32-bit color, an enhanced QuickDraw graphics model, and the role of MultiFinder as the standard operating system.

The interapplication communication facility was described as a "smart clipboard" that would let highly-formatted data pass automatically from one application to another, similar to Microsoft's Dynamic Data Exchange (DDE). Quickergraf, the QuickDraw modification invented by Andy Hertzfeld, will be incorporated into the next release (System 6.0), which will also include MacroMaker for creating simple macros. System 6.0 will also have improved methods for handling fonts, expanding to 16,000 the number of font families you can have in a system. However, the new font facilities will only work with new fonts that will not be available until a later release. The new NFNT font format uses one identification number for a font family rather than one for each version (italic, bold, etc.) of the family. You can therefore keep only the family name (the base style screen font) in your system and still print versions such as italic and bold without having screen fonts in your system.

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OS/2 Applications Debut at Comdex

IBM has announced OS/2 applications that are at or near completion, including IBM's DisplayWrite 4/2, Lotus 1-2-3 release 3.0, Ashton-Tate's dBASE IV, Microsoft Word, and a variety of programming languages. None of these versions use the long-awaited Presentation Manager, and most will not be available until the fall. IBM has also released a directory of over 200 applications for OS/2.

U.S.S.R. To Get Desktop Publishing Centers

AlphaGraphics Printshops of the Future, which already has franchise agreements with 22 countries, expanded negotiations with the Soviet Union to place two desktop publishing and electronic printing centers in Moscow. *PC World* magazine will be published in the USSR too, using a desktop publishing system.

Thought For the Month: Wait Until Tomorrow For OS/2

Microsoft's OS/2 is showing up on dealers shelves, but in most cases the packages are staying on the shelves until more OS/2 applications are released. A truly compelling application that could drag the majority of the DOS world into OS/2 has not yet appeared.

Corporations that develop their own applications remain interested in OS/2, especially the promised Presentation Manager visual interface and toolkit that would help them maintain a consistent corporate-wide interface for all applications. Until Presentation Manager shows up, OS/2 is attractive only as a future development environ-

ment or as an alternative to Unix.

The rank and file DOS user is confused about OS/2. Some think they will need it eventually, others think they will never need it, and most are unwilling to buy it right now because they know that new technology comes on the market at the highest price. Besides, OS/2 requires considerably more disk storage than DOS and at least two megabytes of RAM for a proper configuration.

The bottom line for most computer dealers is that OS/2 is available for those who really want it (mostly early adopters), but sales will not take off until Presentation Manager is ready. Apple's lawsuit may slow down the shipment date of Presentation Manager, but it is unlikely to stop it. As long as OS/2 (with Presentation Manager) is the flagship operating system of IBM, it will lead the fleet of personal workstations.

Access Information

Adobe Systems, Inc., 1585 Charleston Road, P.O. Box 7900, Mountain View, CA 94039-7900. (415) 961-4400.
Aldus Corp., 411 1st Avenue South, Suite 200, Seattle, WA 98104. (206) 622-5500.
Apple Computer Inc., 20525 Mariani Avenue, Cupertino, CA 95104. (408) 996-1010.
Arbortext, 535 W. William Street, Suite 300, Ann Arbor, MI 48103. (313) 996-3566.
Ashton-Tate, 20101 Hamilton Avenue, Torrance, CA 90502. (213) 329-8000.
Autodesk, 2320 Marinship Way, Sausalito, CA 94965. (800) 415-5415.
Barneyscan Corp., 1198 10th Street, Berkeley, CA 94710. (415) 524-6648.
Bitstream Inc., Athenaeum House, 215 First Street, Cambridge, MA 02142. (617) 497-6222.
Compugraphic Corp., 200 Ballardvale Street, Wilmington, MA 01887. (617) 658-5600.
Conographic Corp., 16802 Aston, Irvine, CA 92714. (714) 474-1188.
Cricket Software, 30 Valley Stream Parkway, Malvern, PA 19355. (215) 251-9890.
CText Inc., 1286 Eisenhower Place, Ann Arbor, MI 48108. (313) 971-1011.
Digital Equipment Corp., Continental Blvd., Merrimack, NH 03054. (603) 884-5111.
DocuPro, Inc., 620 Clyde Avenue, Bldg. B, Mountain View, CA 94043-2214. (415) 960-1214.
Eastman Kodak Co., 343 State Street, Rochester, NY 14650. (716) 724-1336.
Frame Technology Corp., 2911 Zanker Road, San Jose, CA 95134. (408) 433-3311.
Hewlett-Packard, 3000 Hanover Street, Palo Alto, CA 94304. (415) 857-1501.
IBM Corp., Information Systems Group, 900 King Street, Rye Brook, NY 10573. (914) 765-3064 or (201) 358-5683.
Interleaf, Inc., 10 Canal Park, Cambridge, MA 02141. (800) 241-7700.
Letraset USA, 40 Eisenhower Drive, Paramus NJ 07653. (201) 845-6100.
Lightspeed, 47 Farnsworth Street, Boston, MA 02210. (617) 338-2173.
Linotype Company, 425 Oser Avenue, Hauppauge, NY 11788. (516) 434-2000.
Micrografx, Inc., 1820 N. Greenville Avenue, Richardson TX 75081. (214) 234-1769.
Microsoft Corp., 16011 NE 36th Way, Redmond, WA 98073. (206) 882-8080.
OmniPage Corp., 1000 Pittsford-Victor Road, Pittsford, NY 14534. (716) 385-8888.
QMS, Inc., P.O. Box 81250, Mobile, AL 36689. (205) 633-4300.
Scribe Systems, Suite 240, Commerce Court, 4 Station Square, Pittsburgh, PA 15219. (412) 281-5959.
Sun Microsystems, Inc., 2550 Garcia Avenue, Mountain View, CA 94043. (415) 960-1300.
SuperMac Technology, 295 N. Bernardo, Mountain View, CA 94043. (415) 964-8884.
Ventura Software, 1188 Padre Drive #201, Salinas, CA 93901. (408) 422-0500.
WordPerfect Corp., 288 W. Center Street, Orem, UT 84507. (801) 225-5000.
Xerox Corp., P.O. Box 24, Rochester, NY 14692. (800) 832-6979.